Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claim 1 (amended): A method for forming a flip chip interconnection structure, comprising

providing a first member on an IC chip and a second member on a substrate, the first member comprising a deformable material having a low yield strength and a high elongation to failure and the second member having surface asperities on a surface on a part of the second member to be bonded with the first member; and

bringing the first member into contact with the surface on the second member and pressing the first and second members against one another using a force sufficient to cause plastic flow of part of the first member into the surface asperities on the second member.

Claim 2 (original): The method of claim 1 wherein the first member is a bump formed on the IC chip.

Claim 3 (original): The method of claim 1 wherein the deformable material of the first member comprises gold.

Claim 4 (original): The method of claim 1 wherein the second member is a surface pad.

Claim 5 (original): The method of claim 1 wherein the second member is a lead.

Claim 6 (original): The method of claim 1 wherein the second member is a via opening.

Claim 7 (original): The method of claim 1 wherein the second member has a plated finish.

Claim 8 (original): The method of claim 1, said bump comprising one of a set of such bumps.

Claim 9 (original): A flip chip interconnection structure made by the method of claim 1.

Claim 10 (withdrawn): A flip chip interconnection structure, comprising

a first member attached to a chip and a second member attached to substrate, the first member being of a deformable material and the first and second members being bonded by mechanical interlocking of the deformable material of the first member with asperities on the surface of the second member.

Claim 11 (withdrawn): The flip chip interconnection structure of claim 10 wherein the first member comprises a bump formed on the chip.

Claim 12 (withdrawn): The flip chip interconnection structure of claim 10 wherein the deformable material of the first member comprises gold.

Claim 13 (withdrawn): The flip chip interconnection structure of claim 10 wherein the second member comprises a surface pad.

Claim 14 (withdrawn): The flip chip interconnection structure of claim 10 wherein the second member comprises a lead.

Claim 15 (withdrawn): The flip chip interconnection structure of claim 10 wherein the second member comprises a via opening.

Claim 16 (withdrawn): The flip chip interconnection structure of claim 10 wherein the second member has a plated finish.

Claim 17 (withdrawn): The flip chip interconnection structure of claim 10, said bump comprising one of a set of such bumps.

Claim 18 (amended): The method of claim 1 wherein a width of the second member <u>surface</u> is smaller than a width of the first member.

Claim 19 (amended): The method of claim 1 wherein the part of the second member to be bonded with the first member has a generally trapezoidal shape in transverse sectional view, ~~and includes~~ the second surface comprising a plateau having a width smaller than a width of the first member.

Claim 20 (previously presented): The method of claim 1, further comprising, prior to pressing the first and second members against one another, dispensing a curable adhesive onto a mating surface of the substrate.

Claim 21 (previously presented): The method of claim 1, further comprising, prior to pressing the first and second members against one another, dispensing a curable adhesive onto a mating surface of the IC chip.

Claim 22 (new): A method for forming a flip chip interconnection structure, comprising

providing a first member on an IC chip and a second member on a substrate, the first member comprising a deformable material having a low yield strength and a high elongation to failure and the second member having a surface adjacent an edge on a part of the second member to be bonded with the first member; and

bringing the first member into contact with the second member surface and pressing the first and second members against one another using a force sufficient to cause plastic flow of part of the first member around the edge.

Claim 23 (new): The method of claim 22 wherein the first member is a bump formed on the IC chip.

Claim 24 (new): The method of claim 22 wherein the deformable material of the first member comprises gold.

Claim 25 (new): The method of claim 22 wherein the second member is a surface pad.

Claim 26 (new): The method of claim 22 wherein the second member is a lead.

Claim 27 (new): The method of claim 22 wherein the second member is a via opening, a margin of the via opening comprising the edge.

Claim 28 (new): The method of claim 22 wherein the second member has a plated finish.

Claim 29 (new): The method of claim 22, said bump comprising one of a set of such bumps.

Claim 30 (new): A flip chip interconnection structure made by the method of claim 22.

Claim 31 (new): The method of claim 22 wherein a width of the second member surface is smaller than a width of the first member.

Claim 32 (new): The method of claim 22 wherein the part of the second member to be bonded with the first member has a generally trapezoidal shape in transverse sectional view, the second member surface comprising a plateau having a width smaller than a width of the first member.

Claim 33 (new): The method of claim 22, further comprising, prior to pressing the first and second members against one another, dispensing a curable adhesive onto a mating surface of the substrate.

Claim 34 (new): The method of claim 22, further comprising, prior to pressing the first and second members against one another, dispensing a curable adhesive onto a mating surface of the IC chip.

Claim 35 (new): The method of claim 22, the second member being provided with asperities on a surface thereof.

Amendments to the Drawings

The attached two sheets of drawings include changes to Figs. 3A and 4A. Sheet 2/3, which includes Figs. 2B, 3A and 3B, replaces original formal drawings sheet 2/3 including Figs. 2B, 3A and 3B. Sheet 3/3, which includes Figs. 4A, 4B, 5 and 6, replaces original formal drawings sheet 3/3, including Figs. 4A, 4B, 5 and 6.

In Fig. 3A, lead line 34 is moved. In Fig. 4A, lead line 46 is moved.

Attachments: Replacement sheets
Annotated sheets showing changes